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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/630,883	08/02/2000	Khosrow Golshan	82259/156	7954

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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 05/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/630,883

Applicant(s)

GOLSHAN, KHOSROW

Examiner

Audrey Y. Chang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-11,13-15,17-22,31,33-36 and 38-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-11,13-15,17-22,31,33-36 and 38-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on March 4, 2002, which has been entered as paper number 6.
- By this amendment, the applicant has amended claims 1, 4-11, 13-15, 21-22, 31, 36, 38-39, 41-44 and 46 and has canceled claims 2, 3, 12, 16, 32 and 37.
- Claims 1, 4-11, 13-15, 17-22, 31, 33-36, and 38-46 remain pending in this application. Claims 23-30 are withdrawn from consideration as being drawn to non-elected invention. The election was made in Paper number 4.
- The rejections to claims 1-10, 11-22, 31-35 and 36-46 under 35 USC 112, first paragraph, set forth in the previous Office Action dated December 3, 2001 are withdrawn in response to applicant's amendment.
- The rejections to claims 1-10, 11-22, 31-35 and 36-46 under 35 USC 112, second paragraph, set forth in the previous Office Action dated December 3, 2001 are withdrawn in response to applicant's amendment.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 4-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 has been amended to include the phrase “a representation of a Boolean logic output” that is indefinite since it is not clear what is considered here as the “representation”. Claims 4-10 inherit the rejection from their based claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 11, 36, 43 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Utaka et al.**

The reasons for rejection are set forth in the previous Office Action dated December 3, 2001.

Claims 11 and 36 have been amended to include an interference region that causes the interference between the wavefronts of the light from the optical input signal entering the interference region. Such feature has been addressed in the previous Office Action. Utaka et al teaches that the wavefronts of the light from the optical input signals via the optical conduits (I and II) intercept and interfere with each other at the region that two conduits meets, (please see Figure 2A).

Claim 11 has been amended to have one of the at least two optical input signals being an optical bias signal. The input optical signals via either the optical conduits I or II, of Utaka et al, may be identified as the bias optical signal. Since as indicated by the applicant the bias optical signal is a light signal and Utaka et al teaches that the input optical signals are provided as light signal, (P₀, column 3). Also the bias optical signal as one of the input optical signals must interfere with the other input signal to

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make the logic gate operable, this means the bias optical signal has to be **coherent** to the other input optical signal. The two input optical signals pass through the two conduits (I and II) of Utaka et al are generated as light input signals and are coherent to each other, it is therefore implicitly true that one of the signals can be identified as the bias optical signal.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-10, 38-42 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over patent issued to Utaka et al.**

The reasons for rejection are set forth in the previous Office Action dated December 3, 2001.

Claim 1 has been amended to include an interference region that causes the interference between the wavefronts of the light from the optical input signal entering the interference region. Such feature has been addressed in the previous Office Action. Utaka et al teaches that the wavefronts of the light from the optical input signals via the optical conduits (I and II) intercept and interfere with each other at the region that two conduits meets, (please see Figure 2A).

Claim 1 has been amended to have the at least two optical input signals being an optical bias signal. The input optical signals via either the optical conduits I or II, of Utaka et al, may be identified as the bias optical signal. Since as indicated by the applicant the bias optical signal is a light signal and Utaka et al also teaches that the input optical signals are provided as light signal, (P₀, column 3). Also the bias optical signal as one of the input optical signals must interfere with the other input signal to make the

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logic gate operable, this means the bias optical signal has to be **coherent** to the other input optical signal. The two input optical signals pass through the two conduits (I and II) of Utaka et al are generated as light input signals and are coherent to each other, it is therefore implicitly true that one of the signals can be identified as the bias optical signal.

7. Claims 13-15 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Utaka et al.

The reasons for rejection are set forth in the previous Office Action and in the paragraphs (for claim 11) above.

8. Claims 31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Yang in view of Utaka et al.

Yang teaches a *binary data processor* for providing various logical functions wherein the processor comprises a coherent light source (11) for *providing light* through *light pipes* (41) serve as *the plurality optical pathways* and *slits* (13 and 14) serves as the *optical inputs* to a portion such that the light from the plurality of pathways or light pipes interfere with each other, (please see Figures 4 and 5, column 4). The interference pattern is transmitted via output light pipes (42) or fiber optic bundle (43) as the optical output light signal that may represent various logic functions such as AND, OR and NOT.

Claim 31 has been amended to include the feature concerning the data processor being formed of optical transmission material patterned on a substrate material. It is extremely well known in the art to form optical logic circuit on a waveguide arrangement with patterned optical waveguides or pathways in a transmission optical material on a substrate material such is demonstrated by the teachings of Utaka et al with patterned optical layer (7) on a substrate (3), (please see Figure 2A). It would then have been obvious to one skilled in the art to apply the teachings of Utaka et al to make the

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data processor with optical logic functions on a waveguide arrangement for the benefit of making it suited for desired applications.

Yang further teaches that logic circuit system having multiple logic steps can be constructed from combination of basic logic functions AND, OR and NOT. In Figure 6, Yang teaches a data processor system having a cascaded series of N optical processing steps that may include various combinations of the basic logic functions. Although this reference does not teach explicitly to have NOT AND (NAND) function and to have NOT and NOT AND function however since these functions are combinations of the basic logic functions, they are therefore either implicitly included or obvious modifications to one skilled in the art.

Response to Arguments

9. Applicant's arguments filed on March 4, 2002 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and rejected for the reasons stated above.

10. Applicant's arguments are mainly drawn to the amended features and amended claims they have been fully addressed in the paragraphs above.

11. The applicant is respectfully reminded that Utaka et al teaches an **interference** type optical waveguide to provide different optical output level this means that either with or without phase modulation the two input light signals via the optical waveguides will interfere with each other at the region when the two signals meets. The interference is "**selective**" when the light signals are modulated.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Audrey Y. Chang
Primary Examiner
Art Unit 2872*



A. Chang, Ph.D.
May 9, 2002